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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

D-1059

In re Patent Application of:

Toshiyuki SATO et al.

Application No.: 09/771,547

Group Art Unit: 2622

Filed: January 30, 2001

Examiner: Y.K. Aggarwal

For: RADIATION DETECTOR

**APPELLANT'S REPLY BRIEF (37 CFR 1.192)**

Date: December 22, 2009

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Further to the Examiner's Answer mailed on October 23, 2009 in connection with the above-identified application on appeal, herewith is Appellants' Reply Brief.

## **ARGUMENT**

The rejections of claims under

- 1) 35 U.S.C. § 103(a) - Appellants' "admitted prior art" in view of Ikeda et al.; and
- 2) 35 U.S.C. § 103(a) - Appellants' "admitted prior art" in view of Ikeda et al. in further view of Yamazaki; are, as clarified in the Examiner's Answer, improper and a reversal of the same is respectfully requested.

The position taken in both of these rejections is based on the premise that the "admitted prior art" teaches a radiation detector comprising an active matrix board (Paragraphs 1-11, Fig. 3, element 10) including gate lines (4) and data lines (5) arranged in a two-dimensional lattice form, a plurality of high-speed switching elements (3) provided at respective lattice points and connected to the gate lines and the data lines, each having a source electrode, pixel electrodes connected to the source electrodes of the high-speed switching elements, and charge storage capacitances (2), each being disposed between the pixel electrode and a ground electrode (Paragraph 3) and a converting layer (1) formed on the pixel electrodes to generate a pair of electron-hole by absorbing one of light and radiation, **said converting layer being formed of a vapor-deposited polycrystalline film of CdTe or CdZnTe** (Paragraphs 3, 8 and 10, figures 2 and 3). (Emphasis added)

However, the Appellants respond by asserting that the position that the "admitted prior art" discloses that the converting layer is formed of a vapor-deposited polycrystalline film of CdTe or CdZnTe is not correct. It is clearly stated in the Appellants' application that it is difficult to directly form a polycrystalline film of CdTe and CdZnTe on the active

matrix board 10 of a-Si:H. This clearly tends to deter any further consideration of such. Viz.:

[0010] (1) In case semiconductor materials other than amorphous selenium (a-Se) as the converting layer 1 are used, semiconductor materials to be used **are restricted due to a heat resistance problem of the active matrix board 10.** For example, in case a polycrystalline film of CdTe or CdZnTe having a more improved sensitivity with respect to X-ray when compared with amorphous selenium is formed by an MOCVD method, proximity sublimation method, paste baking method or the like, which is suitable for forming a large area film, a film forming temperature higher than 300 °C is required. However, generally, a heat resistant temperature of the switching element (TFT) 3 formed on the active matrix board 10 is about 250 °C, in case the amorphous silicon (a-Si:H) is used as a normal semiconductor layer. **Therefore, there is a difficulty in directly forming a polycrystalline film of CdTe and CdZnTe on the active matrix board 10 of a-Si:H.**

Further, the "admitted prior art" contains a clear incentive to use a-Se:H in paragraph [0004]. Viz.,

[0004] As the **converting layer 1** constituting a light conductive layer, a semiconductor material for generating a charge (electron-hole) when radiation, such as X-rays, is irradiated, is used. More specifically,

amorphous selenium (a-Se) having a high dark resistance, a wide dynamic range with respect to X-ray irradiation, a good signal to noise (S/N) ratio and a good light conductive characteristic, is used. The converting layer 1 as the light conductive layer (a-Se) is formed on a glass or quartz base plate, on which the active matrix driving circuit is provided, in a thickness of 300 to 1,000 um by a vacuum deposition method at a temperature lower than 250 °C. Also, since it is possible to lower a cost for a large converting layer 1, a thin film transistor film of hydrogenation amorphous silicon (a-Si:H) containing hydrogen is used as the semiconductor film for the active matrix driving circuit.

This is seen as compounding the understanding of the reader that the use of a-Si:H is preferred and that forming a polycrystalline film of CdTe and CdZnTe on the active matrix board 10 of a-Si:H, is difficult and therefore less preferred if not at all preferred. This leads away from the claimed subject matter.

The manner in which the "admitted prior art" has been relied upon in this rejection is seen as being promoted by a full working knowledge of the claimed subject matter. That is to say, why would a reader consider the disclosure of the "admitted prior art" to suggest or even disclose that the converting layer is formed of a vapor-deposited polycrystalline film of CdTe or CdZnTe, when it is clearly indicated as being difficult?

It is submitted that a patentable invention, within ambit of 35 USC 103, may result even if inventor has, in effect, merely combined features, old in the art, for their known purpose, without producing anything beyond results inherent in their use. As made clear in In re Sponnoble (CCPA) 160 USPQ 237 (1969), it is proper to inquire as to the reasons for making the combination inasmuch as a patentable invention may lie in the discovery of the source of problem even though its remedy may appear obvious once source of problem is identified. This is part of the "subject matter as a whole" analysis which should always be made in determining the obviousness of an invention under § 103. Of course, in making this analysis, special care must be exercised to avoid reading obviousness into the claimed invention on the basis of applicant's own statements. More specifically, the prior art must be considered without reading the applicant's teachings into that art, and to ensure that the teachings of prior art would, in and of themselves and without benefits of applicant's disclosure, make the invention(s) as a whole, obvious.

The claimed invention is based at least in part on the developing a solution to the problem that **there is a difficulty in directly forming** a polycrystalline film of CdTe and CdZnTe on the active matrix board 10 of a-Si:H. The disclosure of this problem is not going to assist the reader in reaching the claimed subject matter, in fact it would deter if not stop any progress toward that which is claimed.

The reliance on Ikeda to teach an X-ray image detector system wherein the TFTs may be formed of polysilicon in order to decrease the size of a TFT so that the effective area of each pixel can be increased, does not obviate the teachings of the "admitted prior art" which, as noted *supra*, contain a deterrent

to the use of a polycrystalline film of CdTe and CdZnTe on the active matrix board 10 of a-Si:H, and does not lead to the situation wherein it would have been obvious to one skilled in the art at the time of the invention to have used poly-silicon as the material for TFTs.

The above noted rejections are hereby traversed for both the reasons advanced above and those previously-presented in the Appellants' Appeal Brief. Appellants hereby respond to selected portions of the Examiner's Answer (EA) mailed October 23, 2009.

Accordingly, reversal of this rejection is respectfully requested.

#### **CONCLUSION**

For the reasons advanced above and in Appellants' Appeal Brief, Appellants respectfully submit that claims 1-7 are patentable at least due to the failure of the applied references to disclose, teach or motivate at least the subject matter recited in these claims. Accordingly, the rejection of claims 1-7 is improper and reversal of the rejections is in order.

Respectfully submitted,

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